

**PARENTS' EFFECT ON OVERWEIGHT AND OBESITY AMONG
MEXICAN AMERICAN CHILDREN:
A LITERATURE REVIEW OF THE BARRIERS TO HEALTHY EATING**

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ABSTRACT

This literature review was conducted to examine the barriers to healthy eating among Mexican American children that originate in the home environment due to parents' food choices and parenting styles. Six articles were selected for their relevance and methodological soundness. The review resulted in eight variables that negatively influence children's dietary habits: lack of knowledge about overweight and obesity, lack of experience with healthy foods, the higher costs of healthy foods, distaste for healthy foods, lack of time to prepare healthy foods, lack of family models and support, level of acculturation, and a controlling parenting style. These variables should be taken into account when designing overweight and obesity intervention strategies for Mexican American children because of the effect parents have on their children's nutrition habits starting in early childhood. This paper suggests that programs tailored to the needs of individual ethnic subgroups are most effective and should specifically target the cultural determinants associated with the eight barriers to healthy eating discussed by the participants in the selected *articles*.

PURPOSE

The purpose of this paper is to review the literature on the barriers to healthy eating habits within the home environment that contribute to overweight and obesity among Mexican American children. Various studies indicate that children who are overweight (who have a body mass index, or BMI, over the 85th percentile for their age) in early childhood are more likely to be overweight as adolescents, and high body weight in children and adolescents is a predictor of obesity, obesity-related diseases and mortality in adulthood.^{1,2,3,4} This is because children begin developing unhealthy behavior patterns that put them at risk for overweight and obesity as early as age four. Creating healthy eating habits in children at an early age is likely to contribute to a healthy weight later in life.⁵ Overweight and obesity interventions should begin early in children's lives, rather than waiting until they are in school⁶, and should target parents' food choices and parenting styles. This review is intended to help us better understand how the Mexican American culture influences parents' decisions and attitudes to better address unhealthy dietary behaviors in overweight and obese children.

INTRODUCTION

Over the past few years, government, the media and the general public have turned their attention to overweight and obesity, as the percentages of affected people of all ethnicities have escalated and the complications associated with overweight and obesity threaten to push national healthcare costs higher. A great deal of discussion on this subject has centered on effective strategies to promote healthier individuals. However, social and cultural factors have a strong influence on people's ability to adopt healthier life styles. The presence of distinct ethnic

subgroups in the United States necessitates programs tailored to their different socio-cultural environments.

Subgroups of children who are at high risk for overweight and obesity should be targeted for treatment and prevention efforts. Researchers recently conducted an analysis of overweight children and adolescentsⁱ based on the 1999-2000 National Health and Nutrition Examination Study (NHANES). They found that the highest percentage of overweight children in the United States were Mexican American and non-Hispanic blacks. The prevalence of overweight males and females, ages two to nineteen, was about 10 percentage points higher than for non-Hispanic whites. Males, ages six to 19, had the highest prevalence of overweight (about 27 percent), or about 15 percent higher than non-Hispanic whites, and seven to 10 percent higher than non-Hispanic blacks (see Table 1).⁷

Table 1

Prevalence of Overweight or at Risk for Overweight in Children by Sex, Race/Ethnicity, and Age Group: NHANES 1999-2000*									
Sex	Age, y	Overweight or at Risk†				Overweight‡			
		All§	Non-Hispanic White	Non-Hispanic Black	Mexican American	All§	Non-Hispanic White	Non-Hispanic Black	Mexican American
Both sexes	2-5	20.6 (1.8)	20.5 (2.7)	19.3 (3.5)	22.7 (3.0)	10.4 (1.7)	10.1 (2.4)	8.4 (2.3)	11.1 (2.5)
	6-11	30.3 (2.4)	26.2 (3.6)	35.9 (3.0)	39.3 (3.0)	15.3 (1.7)	11.8 (2.4)	19.5 (2.0)	23.7 (2.0)#
	12-19	30.4 (1.9)	26.5 (2.4)	40.4 (2.2)	43.8 (2.6)	15.5 (1.2)	12.7 (1.7)	23.6 (2.1)#	23.4 (2.1)#
Male	2-5	20.9 (2.4)	21.4 (3.7)	12.6 (3.1)	26.0 (4.9)	9.9 (2.2)	8.8 (3.2)	5.9 (2.4)	13.0 (3.9)
	6-11	32.7 (3.7)	29.4 (5.7)	34.5 (3.6)	43.0 (4.2)	16.0 (2.3)	12.0 (3.0)	17.1 (2.8)	27.3 (3.1)#
	12-19	30.5 (2.1)	27.4 (3.0)	35.7 (2.8)	44.2 (3.0)	15.5 (1.6)	12.8 (2.4)	20.7 (2.6)	27.5 (3.0)#
Female	2-5	20.4 (3.0)	19.7 (4.1)	26.6 (6.4)	19.5 (4.0)	11.0 (2.5)	11.5 (3.3)	11.2 (3.8)	9.2 (2.9)
	6-11	27.8 (3.2)	22.8 (4.7)	37.6 (3.6)	35.1 (4.4)	14.5 (2.5)	11.6 (3.5)	22.2 (3.3)	19.6 (3.1)
	12-19	30.2 (2.8)	25.4 (3.3)	45.5 (3.0)	43.5 (4.2)	15.5 (1.6)	12.4 (2.1)	26.6 (2.7)#	19.4 (2.8)

*Values are expressed as percentage (SE). NHANES indicates National Health and Nutrition Examination Survey.
†Body mass index for age is at the 85th percentile or higher.
‡Body mass index is at the 95th percentile or higher.
§Includes racial/ethnic groups not shown separately (eg, other category).
||Does not meet standard of statistical reliability and precision (relative SE >30%).
|Includes one influential observation. When this observation is deleted, the prevalence (SE) is 39.6 (2.3).
#Significantly different from non-Hispanic whites at P<.05 (with Bonferroni adjustment).

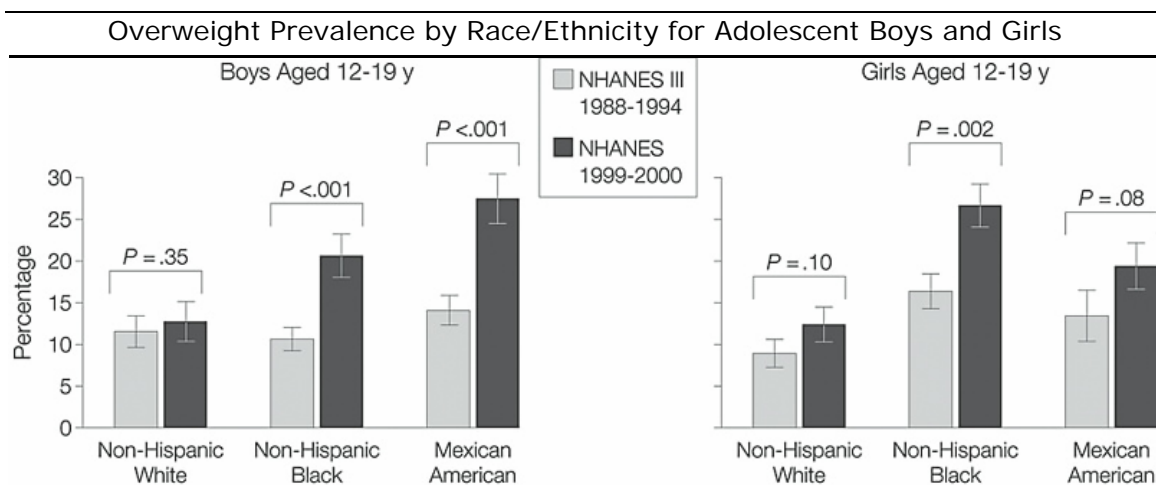
Source: Cynthia L. Ogden, "Prevalence and Trends in Overweight among US Children and Adolescents, 1999-2000."

The study also found that the prevalence of overweight and obesity among Mexican Americans adolescents ages 12 to 19 is increasing. From NHANES III (1988-1994) to NHANES (1999-2000), the prevalence of overweight among Mexican

ⁱ Researchers adopted the Centers for Disease Control and Prevention definition for overweight as the 95th percentile or greater body mass index for age.

American adolescents increased from 13.8 percent to 23.4 percent. Figure 1 shows the increase in overweight by racial subgroup. The largest increase occurred among Mexican American males (13 percent). This is particularly striking because in 1988-1994, virtually no difference existed between racial subgroups in the prevalence of overweight among males (11.6 percent of non-Hispanic whites, 10.7 percent of non-Hispanic blacks, and 14.1 percent of Mexican Americans were overweight). In 1999-2000, 12.8 percent of non-Hispanic whites, 20.7 percent of non-Hispanic blacks, and 27.5 percent of Mexican American adolescent boys were overweight.⁸

Figure 1



Error bars represent standard errors.

Source: Cynthia L. Ogden, "Prevalence and Trends in Overweight among US Children and Adolescents, 1999-2000."

Previous research on the factors that contribute to unhealthy diets in children has tended to focus on individual level determinants such as taste preferences and perceived behavioral control. Researchers have recently turned their attention to environmental determinants of behavior and the barriers they can create to consuming a healthy diet.⁹ Researchers suggest that changes in nutrition cannot be explained or predicted without taking into account the environment in which a child lives. This primarily includes a child's home, neighborhood and school.¹⁰

The home environment is a key setting where behaviors that contribute to childhood overweight and obesity can be addressed. The home protects a child from outside influences, and for most children it is the center of their life, particularly in early childhood. Children's eating habits primarily develop in the home at an early age and are highly dependent on parents' customs and how these influence their food choices and parenting styles. This is because parents determine which foods will be available in the home and they influence children's eating practices through socialization and modeling. As children grow into adolescence they take more control of their dietary intake.^{11,12}

The neighborhood environment can limit or provide opportunities for healthy eating. The availability and accessibility of healthy foods in restaurants and grocery stores within the community are positively associated with children's consumption of healthy foods such as fruits and vegetables.¹³ Most studies on the relationship between the neighborhood and childhood overweight and obesity tend to focus on access to safe areas outdoors that enable children to independently engage in physical activity. Studies have shown that living near a park is positively associated with children's mobility.¹⁴ Safety factors such as sidewalks, traffic speed and density also contribute to children's ability to walk independently around the neighborhood, to visit friends' houses and to go to school.¹⁵

The relationship between the availability of unhealthy foods and childhood overweight and obesity is problematic in the school environment, because school cafeterias and vending machines often carry competitive foods and beverages that tend to be high in fat and calories and low in nutritional value. The presence of these foods in schools is negatively associated with fruit and vegetable consumption.^{16,17} Several studies on the school environment and its influence on childhood overweight and obesity discuss the benefits that instruction in physical activity can have on

increasing children's activity levels. School playgrounds and access to play equipment are important sources of physical activity for children.¹⁸

The role of parents is particularly important because of their ability to create supportive food environments. Moreover, parents have been found to be the environmental determinants most consistently associated with child dietary behavior—more so than neighborhood or school environments—and they are especially influential during early childhood when children begin to develop their dietary habits. This implies that childhood obesity intervention programs should take into account the important influence parents have on their children's nutrition.¹⁹

METHOD

People of Latinoⁱⁱ ancestry make up the largest ethnic subgroup in the United States (14.5 percent of the population, 2.4 percent more than people who are black or African American). Mexican Americans make up 64.0 percent of the Latino population.²⁰ This study focuses on Latinos from a single country of origin because cultures, traditions and attitudes can be very different among peoples of different national ancestries. Research on this largest subgroup of Latinos has been done because it is potentially applicable to the greatest number of people. This is not to say that Latinos originating from other countries do not face similar increases in overweight and obesity or other barriers to maintaining a healthy diet. Studies must be done on the socio-cultural factors that influence the diets of people of all different ethnic backgrounds.

For this paper, several electronic databases were searched for peer reviewed journal articles including Ovid, Blackwell Synergy, Alt HealthWatch, PsycINFO, Medline, ERIC, and ProQuest Research Library. Combinations of the following search

ⁱⁱ The term Latino is used to differentiate people of Latin American ancestry from Hispanic that includes people of Spanish decent.

terms were used to identify articles: Mexican, child*, parent, obesity, overweight, nutrition, food, culture, and environment. Overly specific phrases, like “Mexican American”, were left out of the search because of the limited amount of articles pertaining to overweight and obesity among Latino children of one specific national origin. Searches were limited to articles published between Jan. 2000 and Dec. 2006 in order to include timely research relevant to the current Mexican American population and the increased prevalence of overweight and obesity found in the population today. They were also limited to articles published in the English language in an effort to exclude those that were written about Mexicans living in the United Mexican States.ⁱⁱⁱ

Articles were selected based on their relevancy to the study topic and their solid methodology. To be included, a study had to focus on barriers to healthy eating and analyze either parents’ food choices or parenting styles. Articles were included that used adult cohorts because of the influence parents have on the eating habits of their children.²¹ Previous research indicates that a child has a 40 percent chance of becoming obese if one of his/her parents is obese and an 80 percent chance of becoming obese if both of his/her parents are obese.²² All of the studies selected were conducted on mostly Latino populations, and preference was given to studies conducted on Latinos of Mexican ancestry. Limiting the review to studies performed only on Mexican Americans would have produced insufficient results. However, one article on parents’ food choices and one on parenting styles were selected principally because they used a majority Mexican American sample.

All the articles selected used interviews, focus groups, surveys, or questionnaires. Many articles reported having trouble soliciting Latino participants; this limited the types of methodologies they could use to the ones mentioned. No studies were found using random samples of strictly Mexican Americans. Most of the

ⁱⁱⁱ Commonly referred to as Mexico.

studies used open-ended methods for soliciting responses, such as interviews and focus groups. This enabled the participants to come up with a wide range of answers, giving the researchers a more complete understanding of the reasons behind food choices. Focus groups, in particular, allowed participants to brainstorm in small groups, helping researchers gain a greater understanding of the barriers participants face in eating a healthy diet. Surveys and questionnaires also provided a range of responses, though not as broad in scope as interviews and focus groups.

Three of the articles chosen were conducted in areas close to the Mexico border, with a predominantly Mexican Latino population (in grocery stores within 12 miles of the Arizona-Mexico border, in elementary schools in San Diego, and in Head Start^{iv} centers near the Texas-Mexico border). One study was conducted on Latino migrant workers in several counties in Pennsylvania, a majority of whom were of Mexican ancestry. One study was done in urban middle schools in the Midwest with a majority Latino sample. Only one study involved a national sample of low-income participants, most of which were Latino. Participants in the study were recruited using face-to-face methods and advertisements in low-income neighborhoods and through welfare programs. The study utilized focus group exercises and a telephone survey using a computer-assisted telephone interviewing system. Even though most of the studies were limited to small geographical areas, the results can be applied to other communities, and provide a significant insight into the cultural determinants on diet factors faced by Mexican Americans and other Latinos in the United States. Information on the sample characteristics, objectives and providers in the six studies are described in Table 2.

^{iv} A United States Department of Health and Human Services early childhood development program to increase school readiness among low income children up to age five and pregnant women.

Table 2. Characteristics of Selected Articles			
Author/region/method	Sample characteristics	Objectives	Providers
Abarca <i>et al.</i> ; Arizona-Mexico border; surveys of grocery store managers and data from milk distributors serving southern Arizona	Location: grocery stores Sample size: 8 grocery store managers Age range: all Class: all Ethnicity: all (mostly Latino)	To use grocery store purchases as a community indicator for nutrition and to determine if the diets of residents within 12 miles of the Arizona-Mexico border are high or low in saturated fat and calories. This data is used by the Border Health Strategic Initiative (<i>Border Health iSI!</i>) to determine the effectiveness and status of the program.	A research associate administered the surveys to grocery store managers.
Arredondo <i>et al.</i> ; San Diego, CA; surveys	Location: elementary schools with a minimum of 70 percent of Latino enrollment and no obesity-related intervention program in the past four years Sample size: 812 parents Age range: kindergarten through second grade students Class: all Ethnicity: all Latino (71 percent immigrated from Mexico)	To evaluate the following: 1. Parenting style on children's physical activity and nutrition 2. Sociodemographic characteristics on parenting style and children's health behaviors 3. Socio-demographic characteristics on parents' use of controlling styles to promote healthy behaviors	Parents completed self-administered surveys at their children's schools. Trained research assistants measured children and parents' weight and height.
Cason <i>et al.</i> ; Pennsylvania; focus groups	Location: agencies that work with Latino migrant workers Sample size: 12 focus groups, 117 participants Age range: 18 to 64 years old Class: migrant workers (65.3 percent had annual incomes less than \$25,000) Ethnicity: all Latino (70.1 percent immigrated from Mexico)	To determine the types of foods Hispanic migrant workers choose and prefer, to identify barriers to good nutrition and health (i.e. language, literacy, mobility, cultural and social issues, attitudes, program guidelines, and policies), and to gain an understanding of the social, cultural and lifestyle factors responsible for these barriers.	Two Spanish-speaking moderators with knowledge of food science and nutrition conducted the focus group sessions.
Frenn <i>et al.</i> ; Midwest; multiple choice questionnaires	Location: urban middle school classrooms Sample size: 127 Age range: seventh grade students Class: low income Ethnicity: 60 percent Latino and 40 percent African American	To investigate how stage of change, social support and role models predict physical activity and consuming a low-fat diet and if differences exist based on race, gender, age, income, and ZIP code.	Graduate research assistants administered the questionnaires.
Reifsnider <i>et al.</i> ; Texas-Mexico border; interviews	Location: two Head Start centers in a county with a t population that is 88 percent Hispanic (30 percent foreign born). Sample size: 25 mothers Age range: children had a mean age of 3 years old Class: all Ethnicity: all Latino (47 percent Mexican born)	To determine whether showing parents photographs of children who are overweight, at risk for overweight and normal weight would help them correctly perceive their children's actual sizes and to examine mothers' beliefs about factors that contribute to child health, size and growth.	A trained research team of nurse investigators and graduate nursing students conducted the interviews.
Strolla <i>et al.</i> ; USA; telephone survey and focus groups	Sample size: 474 Age range: all Class: low-income Ethnicity: all (mostly Latino)	To determine barriers and motivators to healthy eating for use in designing more effective nutrition education to reach low-income and ethnic minority populations.	Telephone surveys were conducted using a computer-assisted telephone interviewing system. Trained bilingual moderators led focus groups.

RESULTS

Proper nutrition is integral to overweight and obesity prevention. Studies have shown that Mexican Americans maintain unhealthy diets more so than other ethnic subgroups. Mexican American children have been found to eat more than the recommended daily amount of fat and less than half of the recommended daily quantities of fruits and vegetables. In addition, a higher percentage of the energy they consume comes from saturated fat and they drink more sodas than children of other ethnicities.²³ Six articles were chosen that discuss various barriers to consuming a healthy diet faced by Mexican Americans and other Latinos.

One reason Latino parents do not encourage their children to live healthier lifestyles is that they do not understand overweight and obesity. According to Reifsnider *et al.*, "Perceptions of Children's Body Sizes among Mothers Living on the Texas-Mexico Border (La Frontera)," Latino mothers included in a pilot study did not recognize overweight as a childhood problem and were unaware of their role in preventing overweight in their children. Most mothers related health to a child's happiness and ability to play actively, regardless of body size. They only viewed overweight as harmful if it prevents a child from being physically active. In addition, mothers did not know the factors that cause thinness or overweight and most had the view that a child's body size is determined by the family's body type.²⁴

Inexperience with healthy food choices and lower-fat/lower-calorie alternatives also prevents Latino parents from encouraging their children to consume healthier diets. According to Abarca *et al.*, grocery store managers surveyed on the demand for healthy versus unhealthy foods indicated that residents of predominantly Latino communities along the Arizona-Mexico border tend to consume more unhealthy foods that are high in saturated fat and calories. Most store managers considered the demand for healthy foods to be low to moderate and that unhealthy

foods had a higher demand than healthier equivalents (i.e. regular soda versus diet soda and corn oil versus canola oil). Data collected from milk distributors in southern Arizona were consistent with the survey results and indicate that residents of border communities tend to prefer higher-fat milk than residents of larger cities. The researchers attribute these decisions to lack of knowledge and experience with healthier alternatives and the fact that unhealthy foods are often cheaper.²⁵

Strolla *et al.* also conducted a study that suggests that the lack of knowledge and experience with healthy foods are major barriers to consuming less fat. In low-income, predominantly Latino households, sample participants most often mentioned not knowing how to eat a low-fat diet and not knowing how much fat is in foods as the main reasons for eating foods high in fat. Cost was another barrier to their eating fruits and vegetables, and many respondents reported not liking the taste if different than the taste of fresh produce found in their home country.²⁶

Similarly, Cason *et al.* observed that Latino parents determine their food choices based on their taste preferences and found cost a barrier to choosing healthier foods. Lack of time to prepare healthy foods was also considered a barrier. The researchers found that Latino migrant workers in Pennsylvania did not take nutrition and healthiness into consideration when choosing foods. Acculturation was a main factor contributing to participants' consuming fewer healthy foods and eating more fast food and restaurant food. While most participants indicated that they preferred traditional foods from their home countries, many of them included American foods among their favorites, and some said that their children like and sometimes prefer American foods. Cost was also discussed as a barrier to buying healthier foods such as meat, fruits and vegetables that are cheaper in their home country. Time was another factor participants mentioned that limited their ability to cook three meals a day as they did in their home country and they often ate fast food and junk food for the sake of convenience.²⁷

Other determinants of children's healthy eating patterns are family models and support. The study by Frenn *et al.* found that among low-income Latinos and African Americans, parents who are positive role models and who support healthy behaviors like physical activity and consuming a low-fat diet strongly influence their children's eating habits. However, family models and support tends to decrease as family income decreases. Surprisingly, the lowest income Latino students that lived in areas with a high concentration of Latinos had strong family role models and ate less dietary fat. The authors suggest that the greater availability of traditional foods within the neighborhood tended to help immigrant families, even those who have little time to cook, maintain a traditional diet as opposed to adopting a fast food American diet. These findings are similar to those of Cason *et al.* that parents' lack of time to cook is related to food choice.²⁸

The barriers to healthy eating such as family support, lack of knowledge and the time and costs associated with preparing healthier meals are commonly found in obesity related studies. Arredondo *et al.* conducted a unique examination of how effective parenting styles can reduce children's risk for overweight and obesity. The researchers suggest that positive reinforcement and monitoring tends to contribute to healthy eating and exercise habits. In contrast, inappropriate discipline such as threats and bribes and a controlling style characterized as highly directive, demanding and strict tends to contribute to unhealthy habits. A controlling parent has a particularly negative effect on girls. A lax parenting style with few restrictions is also ineffective, especially among boys. These gender differences could be because girls and boys differ in their awareness of or responsiveness to parental restrictions, or because parents treat girls and boys differently.²⁹

Arredondo *et al.* note that the Mexican culture generally emphasizes respect for authority and Mexican parents tend to employ strict disciplinary styles. While many Mexican American parents demonstrate authoritarian styles, this may be more

closely attributed to low education and income levels. In addition, controlling styles are more common among Latino parents who are younger and less acculturated. The authors recommend that parenting interventions should encourage parents to monitor their children's dietary intake and physical activity and to set goals and limits. These can be reinforced with things like stickers and praise.³⁰

DISCUSSION

The barriers mentioned in the six articles include a lack of knowledge about overweight and obesity, lack of experience with healthy foods, the higher costs of healthy foods (particularly meat and fresh produce), distaste for healthy foods, lack of time to prepare healthy foods, lack of family models and support, acculturation, and a controlling parenting style. Most are straightforward, but some incorporate more than one idea. The variable "lack of knowledge about overweight and obesity" encompasses the inability of parents to see their children as overweight and obese, or to recognize the health risks associated with overweight and obesity, or to know how to prevent unhealthy dietary habits. "Lack of experience with healthy foods" is used to describe parents who do not consider healthiness or nutrition as a factor when buying food, who do not know how to eat a lower-fat diet and who do not know how much fat is in the foods they eat. Interestingly, the availability of traditional foods in areas with high concentrations of Latinos is related to both "lack of time to prepare healthy foods" and "acculturation". Parents who do not have time to prepare meals, and less acculturated parents living in areas with a high concentration of Latinos, tend to buy healthier traditional foods in their community instead of American fast food. Although lack of acculturation is associated with parents buying healthier traditional foods, Arredondo *et al.* relates lack of

acculturation to parents using controlling parenting styles that influence unhealthy eating habits in their children.³¹ See Table 3 for an explanation of all six variables.

Table 3. Synthesis Matrix			
Variable	Article(s)	Method(s)	Combined Description
Lack of knowledge about overweight and obesity	Reifsnider <i>et al.</i>	Interviews	Parents are not able to identify overweight and obesity in their children, they do not understand the health risks, and they are unaware of their role in preventing weight gain.
Lack of experience with healthy foods	Abarca <i>et al.</i> Strolla <i>et al.</i> Cason <i>et al.</i>	Surveys of grocery store managers, telephone survey and focus groups	Parents do not take healthiness into consideration when buying food for the home. They also buy foods that are high in fat and calories because they do not know how to eat a low-fat diet or how much fat is in foods.
The higher costs of healthy foods	Abarca <i>et al.</i> Strolla <i>et al.</i> Cason <i>et al.</i>	Surveys of grocery store managers, telephone survey and focus groups	Parents have limited incomes and tend to buy unhealthy foods because they are often cheaper. This is particularly true for meats and fresh fruits and vegetables.
Distaste for healthy foods	Strolla <i>et al.</i> Cason <i>et al.</i>	Telephone survey and focus groups	Parents often base their food choices on taste preferences. In addition, produce found in their home country is not available in the United States and they dislike the taste of fruits and vegetables that are available.
Lack of time to prepare healthy foods	Cason <i>et al.</i> Frenn <i>et al.</i>	Focus groups and multiple choice questionnaires	Most parents work and do not have time to prepare healthy meals. As a result, they often eat at restaurants and fast food establishments out of convenience. However, parents that live in areas with a high concentration of Latinos tend to buy healthier traditional foods because they are accessible.
Lack of family models and support	Frenn <i>et al.</i>	Multiple choice questionnaires	Parents that are positive role models and support eating healthy foods influence their children to do so as well, but the presence of models and support decreases as family income decreases. This is important because most Mexican Americans earn lower-incomes.
Acculturation	Cason <i>et al.</i> Frenn <i>et al.</i> Arredondo <i>et al.</i>	Focus groups, multiple choice questionnaires and surveys	As parents become more acculturate, they tend to eat more American foods and dine at restaurants and fast food establishments. Less acculturate parents that live in areas with a high concentration of Latinos tend to eat healthier traditional foods because they are more accessible. However, less acculturate parents tend to have more controlling parenting styles, which is associated with poorer eating habits in children.
Controlling parenting style	Arredondo <i>et al.</i>	Surveys	Inappropriate discipline and a controlling parenting style tends to contribute to children eating unhealthy foods and overeating, particularly among girls. Positive reinforcement and monitoring is positively related to healthy eating. Parents who lack education, have lower-incomes, are younger, and are less acculturate tend to have controlling parenting styles.

Participants in focus groups were aware of five of the eight barriers to healthy eating habits: “lack of experience with healthy foods”, “the higher costs of healthy foods”, “distaste for healthy foods”, “lack of time to prepare healthy foods”, and “acculturation”. This could be due to the open-ended nature of the methodology and the ability of participants to bounce thoughts and ideas off one another. Surveys also generated several of the variables: “lack of experience with healthy foods”, “the higher costs of healthy foods”, “acculturation”, and “controlling parenting style”.

The barriers to maintaining a healthy diet most often mentioned are “lack of experience with healthier foods”, “the higher costs of healthier foods” and “acculturation”. Because these concerns appear to be the most common among Mexican American parents, overweight and obesity intervention strategies should focus on educating parents about the fat and caloric content of food (particularly American foods) and how to shop for low-fat, low-calorie foods that are affordable. “Distaste for healthy foods” was referred to in two articles, and participants often explained that they do not like the taste of the fruits and vegetables available in the United States. To address this matter, programs might want to encourage grocery stores to carry more produce found in Latin American countries or to teach parents how to cook healthy meals using American produce. “Lack of time to prepare healthy foods” was also discussed in two articles. Parents explained that working long hours leaves them with little time to cook healthy or traditional meals and they instead buy restaurant and fast food out of convenience. A greater availability of healthier foods in neighborhood restaurants and fast food establishments could therefore improve the nutrition among the entire family.

Although “controlling parenting style” was only discussed in the article by Arredondo *et al.*, the uniqueness of the study deserves attention. According to the authors, Mexican American parents have a tendency to use controlling styles and discipline their children for eating unhealthy foods and overeating. This parenting

style is associated with parents who have lower-incomes, and are younger, lack education, and are less acculturated. Consequently, childhood overweight and obesity intervention programs that focus on parenting styles should seek to educate parents on how to encourage healthy eating habits using positive reinforcement and monitoring.³² These suggestions are also supported by Frenn *et al.* who found that lower-income parents, like many Mexican Americans, are less supportive of healthy eating habits in their children and are less inclined to be positive role models. Educating parents on how to create a supportive home environment could improve the eating habits of their children.³³

This literature review was limited by the methodologies used in the selected articles. While all of the articles reviewed used creditable methods, none of the studies used random samples. Consequently, the results of the studies are not a true representation of the behaviors and attitudes of the Mexican American community as a whole. In addition, all but one of the studies were conducted in limited geographical areas, and the results might not be fully applicable to Mexican Americans throughout the entire United States. However, this particular subject is difficult and expensive to study by methods other than case studies on small groups of Mexican Americans. Thus, the results of this literature review are discussed in broad terms to improve their applicability to the entire Mexican American community.

CONCLUSION

Childhood overweight and obesity intervention should begin at an early age and should target parents and the home environment. This paper suggests that programs that are tailored to the needs of ethnic subgroups are more effective because they address the influence that culture has on parents' food choices and

parenting styles and how these impact the eating habits of children. The eight barriers to healthy eating discussed by the participants in the selected articles most often indicate that educating parents is the first step to overcoming cultural determinants that are harmful to childhood nutrition. Government agencies and private sector organizations concerned with childhood overweight and obesity should therefore look to the home environment as a starting point in devising intervention strategies.

REFERENCES

- 2005 American Community Survey United States Census Bureau, 2005 [cited Dec. 5 2006]. Available from <http://www.census.gov/acs/www/>.
- Abarca, J., S. Ramachandran. "Using Community Indicators to Assess Nutrition in Arizona-Mexico Border Communities." *Preventing Chronic Disease: Public Health Research, Practice, and Policy* 2, no. 1 (2005): 1-7.
- Arredondo, A.M., J.P. Elder, G.X. Ayala, N. Campbell, B. Baquero, S. Duerksen. "Is Parenting Style Related to Children's Healthy Eating and Physical Activity in Latino Families?" *Health Education Research* 21, no. 6 (2006): 862-71.
- Cason, K., S. Nieto-Montenegro, A. Chavez-Martinez. "Food Choices, Food Sufficiency, Practices, and Nutrition Education Needs of Hispanic Migrant Workers in Pennsylvania." *Topics in Clinical Nutrition* 21, no. 2 (2006): 145-58.
- Davison, K.K., L.L. Birch. "Childhood Overweight: A Contextual Model and Recommendations for Future Research." *Obesity Reviews* 2 (2001): 159-71.
- Frenn, M., S. Malin, A.M. Villarruel, K. Slaikeu, S. McCarthy, J. Freeman, E. Nee. "Determinants of Physical Activity and Low-Fat Diet among Low Income African American and Hispanic Middle School Students." *Public Health Nursing* 22, no. 2 (2005): 89-97.
- Kubik, M.Y., L.A. Lytle, P.J. Hannan, C.L. Perry, M. Story. "The Association of the School Food Environment with Dietary Behaviors of Young Adolescents." *American Journal of Public Health* 93, no. 7 (2003): 1168-73.
- Mirza, N.M., K. Kadow, M. Palmer, H. Solana, C. Rosche, J.A. Yanovski. "Prevalence of Overweight among Inner City Hispanic-American Children and Adolescents." *Obesity Research* 12, no. 8 (2004): 1298-310.
- Must, A., P. Jacques, G. Dallal, C. Bajema, W. Dietz. "Long-Term Morbidity and Mortality of Overweight Adolescents." *New England Journal of Medicine* 327 (1992): 1350-55.

- Nader, P.R., M. O'Brien, R. Houts, R. Bradley, J. Belsky, R. Crosnoe, S. Friedman, Z. Mei, E.J. Susman. "Identifying Risk for Obesity in Early Childhood." *Pediatrics* 118, no. 3 (2006): 594-601.
- Nieto, F., M. Szklo, G. Comstock. "Childhood Weight and Growth Rate as Predictors of Adult Mortality." *American Journal of Epidemiology* 136 (1992): 201-13.
- Ogden, C.L., K.M. Flegal, M.D. Carroll, C.L. Johnson. "Prevalence and Trends in Overweight among Us Children and Adolescents, 1999-2000." *Journal of the American Medical Association* 288, no. 14 (2002): 1728-32.
- Prezza, M., S. Piloni, C. Morabito, C. Sersante, F. Alparone, M. Giuliani. "The Influence of Psychosocial and Environmental Factors on Children's Independent Mobility and Relationship to Peer Frequentation." *Journal of Community and Applied Social Psychology* 11 (2001): 435-50.
- Reifsnider, E., A.R. Flores-Vela, D. Beckman-Mendez, H. Nguyen, C. Keller, S. Dowdall-Smith. "Perceptions of Children's Body Sizes among Mothers Living on the Texas-Mexico Border (La Frontera)." *Public Health Nursing* 23, no. 6 (2006): 488-95.
- Reifsnider, E., C.S. Keller, M. Gallagher. "Factors Related to Overweight and Risk for Overweight Status among Low-Income Hispanic Children." *Journal of Pediatric Nursing* 21, no. 3 (2006): 186-96.
- Sallis, J.F., T.L. Conway, J.J. Prochaska, T.L. McKenzie, S.J. Marshall, M. Brown. "The Association of School Environments with Youth Physical Activity." *American Journal of Public Health* 91 (2001): 618-20.
- St-Onge, M.P., K.L. Keller, S.B. Heymsfield. "Changes in Childhood Food Consumption Patterns: A Cause for Concern in Light of Increasing Body Weights." *American Journal of Clinical Nutrition* 78, no. 6 (2003): 1068-73.
- Strolla, L.O., K.M. Gans, P.M. Risica. "Using Qualitative and Quantitative Formative Research to Develop Tailored Nutrition Intervention Materials for a Diverse Low-Income Audience." *Health Education Research* 21, no. 4 (2006): 465-76.
- Tudor-Locke, C., B.E. Ainsworth, B.M. Popkin. "Active Commuting to School: An Overlooked Source of Children's Physical Activity?" *Sports Medicine* 31 (2001): 309-13.
- Van der Horst, K., A. Oenema, I. Ferreira, W. Wendel-Vos, K. Giskes, F. van Lenthe, J. Brug. "A Systematic Review of Environmental Correlates of Obesity-Related Dietary Behaviors in Youth." *Health Education Research* (July 21, 2006) (e-published ahead of print): 1-24.

ENDNOTES

¹ P.R. Nader, M. O'Brien, R. Houts, R. Bradley, J. Belsky, R. Crosnoe, S. Friedman, Z. Mei, E.J. Susman, "Identifying Risk for Obesity in Early Childhood," *Pediatrics* 118, no. 3 (2006).

² A. Must, P. Jacques, G. Dallal, C. Bajema, W. Dietz, "Long-Term Morbidity and Mortality of Overweight Adolescents," *New England Journal of Medicine* 327 (1992).

³ F. Nieto, M. Szklo, G. Comstock, "Childhood Weight and Growth Rate as Predictors of Adult Mortality," *American Journal of Epidemiology* 136 (1992).

⁴ E. Reifsnider, C.S. Keller, M. Gallagher, "Factors Related to Overweight and Risk for Overweight Status among Low-Income Hispanic Children," *Journal of Pediatric Nursing* 21, no. 3 (2006).

⁵ K. Van der Horst, A. Oenema, I. Ferreira, W. Wendel-Vos, K. Giskes, F. van Lenthe, J. Brug, "A Systematic Review of Environmental Correlates of Obesity-Related Dietary Behaviors in Youth," *Health Education Research* (July 21, 2006) (e-published ahead of print).

⁶ E. Reifsnider, A.R. Flores-Vela, D. Beckman-Mendez, H. Nguyen, C. Keller, S. Dowdall-Smith, "Perceptions of Children's Body Sizes among Mothers Living on the Texas-Mexico Border (La Frontera)," *Public Health Nursing* 23, no. 6 (2006).

⁷ C.L. Ogden, K.M. Flegal, M.D. Carroll, C.L. Johnson, "Prevalence and Trends in Overweight among Us Children and Adolescents, 1999-2000," *Journal of the American Medical Association* 288, no. 14 (2002).

⁸ Ibid.

⁹ Van der Horst, "A Systematic Review of Environmental Correlates of Obesity-Related Dietary Behaviors in Youth."

¹⁰ K.K. Davison, L.L. Birch, "Childhood Overweight: A Contextual Model and Recommendations for Future Research," *Obesity Reviews* 2 (2001).

¹¹ Van der Horst, "A Systematic Review of Environmental Correlates of Obesity-Related Dietary Behaviors in Youth."

¹² Reifsnider, "Factors Related to Overweight and Risk for Overweight Status among Low-Income Hispanic Children."

¹³ Van der Horst, "A Systematic Review of Environmental Correlates of Obesity-Related Dietary Behaviors in Youth."

¹⁴ M. Prezza, S. Piloni, C. Morabito, C. Sersante, F. Alparone, M. Giuliani, "The Influence of Psychosocial and Environmental Factors on Children's Independent Mobility and Relationship to Peer Frequentation," *Journal of Community and Applied Social Psychology* 11 (2001).

¹⁵ C. Tudor-Locke, B.E. Ainsworth, B.M. Popkin, "Active Commuting to School: An Overlooked Source of Childrens' Physical Activity?," *Sports Medicine* 31 (2001).

¹⁶ M.P. St-Onge, K.L. Keller, S.B. Heymsfield, "Changes in Childhood Food Consumption Patterns: A Cause for Concer in Light of Increasing Body Weights," *American Journal of Clinical Nutrition* 78, no. 6 (2003).

¹⁷ M.Y. Kubik, L.A. Lytle, P.J. Hannan, C.L. Perry, M. Story, "The Association of the School Food Environment with Dietary Behaviors of Young Adolescents," *American Journal of Public Health* 93, no. 7 (2003).

¹⁸ J.F. Sallis, T.L. Conway, J.J. Prochaska, T.L. McKenzie, S.J. Marshall, M. Brown, "The Association of School Environments with Youth Physical Activity," *American Journal of Public Health* 91 (2001).

¹⁹ Van der Horst, "A Systematic Review of Environmental Correlates of Obesity-Related Dietary Behaviors in Youth."

²⁰ *2005 American Community Survey* (United States Census Bureau, 2005 [cited Dec. 5 2006]); available from <http://www.census.gov/acs/www/>.

-
- ²¹ N.M. Mirza, K. Kadow, M. Palmer, H. Solana, C. Rosche, J.A. Yanovski, "Prevalence of Overweight among Inner City Hispanic-American Children and Adolescents," *Obesity Research* 12, no. 8 (2004).
- ²² Reifsnider, "Factors Related to Overweight and Risk for Overweight Status among Low-Income Hispanic Children."
- ²³ J. Abarca, S. Ramachandran, "Using Community Indicators to Assess Nutrition in Arizona-Mexico Border Communities," *Preventing Chronic Disease: Public Health Research, Practice, and Policy* 2, no. 1 (2005).
- ²⁴ Reifsnider, "Perceptions of Children's Body Sizes among Mothers Living on the Texas-Mexico Border (La Frontera)."
- ²⁵ Abarca, "Using Community Indicators to Assess Nutrition in Arizona-Mexico Border Communities."
- ²⁶ L.O. Strolla, K.M. Gans, P.M. Risica, "Using Qualitative and Quantitative Formative Research to Develop Tailored Nutrition Intervention Materials for a Diverse Low-Income Audience," *Health Education Research* 21, no. 4 (2006).
- ²⁷ K. Cason, S. Nieto-Montenegro, A. Chavez-Martinez, "Food Choices, Food Sufficiency, Practices, and Nutrition Education Needs of Hispanic Migrant Workers in Pennsylvania," *Topics in Clinical Nutrition* 21, no. 2 (2006).
- ²⁸ M. Frenn, S. Malin, A.M. Villarruel, K. Slaikeu, S. McCarthy, J. Freeman, E. Nee, "Determinants of Physical Activity and Low-Fat Diet among Low Income African American and Hispanic Middle School Students," *Public Health Nursing* 22, no. 2 (2005).
- ²⁹ A.M. Arredondo, J.P. Elder, G.X. Ayala, N. Campbell, B. Baquero, S. Duerksen, "Is Parenting Style Related to Children's Healthy Eating and Physical Activity in Latino Families?," *Health Education Research* 21, no. 6 (2006).
- ³⁰ Ibid.
- ³¹ Ibid.
- ³² Ibid.
- ³³ Frenn, "Determinants of Physical Activity and Low-Fat Diet among Low Income African American and Hispanic Middle School Students."